tral Doppler (E, A) and lateral and septal mitral annular systolic (Sa) and diastolic (Ea) velocity measurements and their mean (Samean and E/Eamean). Age and LVEF were 56±11y and 28±8%; 39% had ischemic cardiopathy; 75% were NYHA ¾; 48% had increased PCWP>15 mmHg. Correlations between PCWP and the three tested E/Ea ratios ranged from 0.33 to 0.47 and E/Ealat showed the best (all p<0.001). Fifty-five patients (44%) had an elevated E/Ealat >15. Specificity and sensitivity of E/Ealat for increased PCWP were globally poor (76%; CI95[65-86] and 58%; CI95[45-71%]). The cohort was sub-divided into quintiles accordingly to Salat velocity. In patients with higher lateral Salat>4.5 cm/s (three upper quintiles, N=78), specificity of E/Ealat for increased PCWP was 91% CI95[:78-97], significantly higher (p<0.01) than in the two lower quintiles with Sa<4.5 cm/s (39%; CI95[17-64]). In contrast, sensitivity of E/Ealat was not significantly different among groups of Salat. When considering E/Ealat as a continuous variable, area under the ROC curve (AUC) was 0.72 (0.63-0.79) in the entire population. AUC was better in the group with Salat >4.5 cm/s (0.82 [0.71-0.92] than the group with Sa≤4.5 cm/s (0.54 [0.38-0.7]); with significant difference between the two AUCs (p=0.005). Specificities, sensitivities and AUCs of, E/Eamean, and E/Easept after stratifying for Salat values were lower than those observed with E/Ealat.

Conclusion: Our data suggest that E/Ealat may be a reliable tool to identify patients with normal LV filling pressure in severe systolic HF if longitudinal contractility is preserved (Salat>4.5cm/s).

164

New parameters for the quantification of the right ventricle systolic function: a prospective MRI study

Marie Piquemal [Orateur] (1), Olivier Genée (2), Anne Delhommais (3), Julien Pucheux (3), Daniel Alison (3)
(1) CHU Trousseau, Cardiologie, Chambray Les Tours , France – (2) Clinique de la Reine Blanche, Cardiologie, Orléans, France – (3) CHU Trousseau, Radiologie, Chambray Les Tours, France

Purpose: Cardiac MRI is the gold standard for studying the right ventricle (RV) systolic function, a well-established prognosis determinant of cardiomyopathies. We sought to identify new reliable and less time consuming parameters than endocardial delineation, for assessing right ventricular systolic function.

Methods: Forty three unselected patients (31 males, 12 females) aged 19-81 years who were referred for cardiac MRI in a University Hospital center were included consecutively.

MRI Right and Left Ventricle Ejection Fraction (RVEF, LVEF) were measured by defining the contour of the endocardium. In a subsequent post-treatment investigation, we blindly measured MRI TAPSE (mTAPSE), and the RV diastolic and systolic diameters (dD, sD) at basal and medial levels in a short axis view. We then calculated new parameters we called Fractionnal Basal Diameter Change FBDC=(basal dD – basal sD)/ basal dD, and Fractionnal Medial Diameter Change (FMDC) calculated by the same method at a medial level.

Results: Thirty five patients had a RVEF>40% (group A), 8 patients (19%) had a RVEF<40% (group B).

MRI stroke RV and LV volumes showed very strong correlations (r=0,87 p<0,0001), thus MRI RVEF was a reliable measurement.

In group A, FBDC was 0.23+/–0.08, FMDC was 0.22+/–0.11 and mTAPSE was 24 +/–9 mm. In group B, FBDC, FMDC and mTAPSE were significantly lower than in group A (FBDC=0.14 +/–0.11 p=0.01, FMDC=0.13+/–0.11 p=0.04, mTAPSE=16+/–5 mm p=0.02).

Conclusions: New regional right ventricle parameters correlated well with MRI RVEF especially at a basal level. These parameters appeared more significant than TAPSE, a well-established parameter of systolic right ventricle function in echocardiography.

165

Comparison between echocardiographic (TTE) and cardiac magnetic resonance (CMR) parameters of left ventricular afterload and remodeling

Nataliya Hrynchyshyn [Orateur] (1), Nadjia Kachenoura (2), Benoît Diebold (3), Marion Sénési (2), Alban Redheuil (3), Elie Mousseaux (3), Ludivine Perdrix (3)
(1) AP-HP, Hôpital Européen Georges Pompidou, Paris, France – (2) Laboratoire d'Imagerie Fonctionnelle, Inserm U678, Paris, France – (3) Université Paris-Descartes, Paris, France

Objective: To investigate the value of TTE and CMR in the assessment of left ventricular (LV) adaptation to an increased afterload and to analyze the effect of the on LV systolic function.

Background: To maintain an effective LV-arterial coupling, the LV adapts to the increased afterload by changing its geometry with subsequent hypertrophic-remodelingresulting in a reduction of the effective systolic myocardial wall stress.

Methods: We studied a group of 49 subjects: 35 healthy subjects (group I, 38±13 years) and 14 patients with aortic valve stenosis (group II, 77±9 year, valve area=0.75±0.18 cm²). We calculated: 1)TTE parameters of wall stress (SMWS, 10^3dyn/cm²), remodeling (h/r), and systolic function (LVEF ejection fraction (2D-EF, %), 2D longitudinal global strain (global-ε, %); 2)CMR end-diastolic mass to volume ratio (LVM/EDV, g/ml) as well as the 3D systolic myocardial wall stress (3D SMWS, 10^3.N/m²) combining LV geometry(3DLVgf) and arterial load. The Statistical analysis was performed by Pearson correlation coefficient and t-test.

Results: LVEF was homogeneous in 2 groups (I=64%, II=62%, p=0.69). Significant difference was found between the 2 groups in terms of SMWS, global-ε and h/r (p<0.05). Furthermore, while no correlation was found between TTE and CMR parameters in the group I, significant correlations were found in group II for the comparisons: 1-TTE and CMR parameters of LV remodeling (LVM/EDV and h/r), (r=0.87, p=0,0005); 2-CMR LV geometry factor (3DLVgf) and TTE 2D global-ε(r=–0.79, p=0,005); 3-CMR SMWS and TTE 2D global-ε(r=–0.8, p=0,005); 4 – CMR SMWS and TEE SMWS (r=0.78, p=0,0005).

Conclusion: Increased afterload results in LV remodeling with good correlation between CMR and TEE parameters. Its effect on LV function was revealed by the good negative correlation between CMR SMWS and TTE-global-ε, which was found despite the preserved LVEF. Parameters of longitudinal systolic dysfunction may have a clinical interest in management of patients with preserved LVEF as a predictor of heart failure.

Keywords: LV remodeling, systolic myocardial wall stress, global longitudinal strain, echocardiography, cardiac magnetic resonance

166

Importance of left ventricular remodelling and regional wall motion abnormalities in the occurrence of functional ischemic mitral regurgitation

Leila Bezdah [Orateur], Emna Allouche, Chadia Chourabi, Wafa Falah, W. Ouechtati, Slim Sidhom, N. Haddad, Hedi Baccar
HCN, Cardiologie, Tunis, Tunisie

Introduction: Functional ischemic mitral regurgitation (IMR) is common in patients with ischemic left ventricular dysfunction after myocardial infarction, and significantly worsens prognosis. The aim of this study is to determine the relative importance of the global and regional left ventricular (LV) remodelling in the occurrence of IMR.

Methods: 81 patients (mean age=61±11 years) admitted with acute myocardial infarction (AMI) were screened. Patients with atrial fibrillation and organic valvular diseases were excluded from the study. Echocardiography (two-dimensional and Doppler echocardiograms) was performed in the first week after admission. The 81 patients were divided in 2 groups: with IMR (group 1=39 patients) and without IMR (group 2=42 patients). LV volumes were calculated by apical biplane Simpson's rule. The LV wall-motion score (WMS) index was obtained in a 17 segment model according to established

▶

methods. To identify the influence of regional wall-motion impairment for each individual LV segment, the mean WMS was calculated for each segment and compared between the 2 groups.

Results: The echocardiographic parameters that were associated with IMR were: LV dilatation and sphericity (p<0,0001), reduced ejection fraction (p<0,0001), inferior (p<0,001) inferolateral (p=0,01) and anterolateral (p= 0.02) asynergy.

Conclusion: The results of this study indicate the importance of abnormalities of both LV geometry and regional wall motion in the pathogenesis of IMR after myocardial infarction. Clinically, theses findings imply that myocardial salvage by early coronary revascularisation may improve outcome by preserving LV function and decreasing the incidence of IMR.

167

Screening of coronary artery disease in patients with COPD: feasibility and safety of SPECT

Olivier Dahan [Orateur] (1), Olivier Lairez (1), Nicolas Boudou (1), Roger Escamilla (2), Delphine Bastié (3), Rainui Richaud (3), Jérôme Roncalli (1), Didier Carrié (1), Isabelle Berry (4), Michel Galinie (1)
(1) CHU Rangueil, Fédération des services de Cardiologie, Toulouse, France – (2) CHU Rangueil, Pneumologie, Toulouse, France – (3) CHU Rangueil, Centre d'Imagerie Cardiaque, Toulouse, France – (4) CHU Rangueil, Médecine Nucléaire, Toulouse, France

Background: Chronic obstructive pulmonary disease (COPD) is an independent cardiovascular risk factor, even after adjustment for smoking habitus, and cardiovascular diseases are the main cause of mortality in patients with COPD. Current guidelines suggest a systematic screening of coronary artery disease (CAD) in high cardiovascular risk patients. Dyspnea and poor acoustic window limit the efficiency of the stress testing and stress echocardiography in patients with COPD. The use of SPECT seems to be the best tool for the systematic screening of CAD in patients with COPD, but there is no study that explores the feasibility of SPECT in patients with COPD.

Objective: The aim of our study was to determine the feasibility and the safety of SPECT for the systematic screening of CAD in patients with COPD.

Methods: Between June 2010 and June 2011, 42 patients with COPD confirmed by spirometry and without history of CAD underwent systematic screening of CAD. CAD was screened by stress testing if feasible or SPECT if stress testing was not feasible. When stress testing reveals myocardial ischemia or when it was no contributively, screening was complete by SPECT. Stress protocol for SPECT was chosen by the nuclear imager.

Results: Six (14.3%) patients underwent stress testing only, 25 (59.5%) patients underwent SPECT only and 12 (28.6%) patients underwent both. Between the 31 SPECT (73.8% of the total population), dipyridamol and dobutamine were used for 25 (80.6%) and 2 (6.4%) patients respectively; and mean rest left ventricular ejection fraction (LVEF) was 63±24% with 2 (6.4%) and 3 (9.7%) patients with LVEF<50% at rest and after stress respectively. Myocardial ischemia and myocardial infarction were found in 3 (7.1%) and 4 (9.5%) different patients respectively. In the total population, CAD prevalence defined by myocardial ischemia and/or myocardial infarction was 19%. There was no complication of SPECT even when stress protocol used dipyridamol.

Conclusion: SPECT with or without dipyridamol is feasible and safe for the systematic screening of CAD in patients with COPD. CAD detected by SPECT is frequent in patients with CAD.

168

Is two-dimensional speckle tracking ready for current practice?

Feriel Moatemri [Orateur], Natalya Hrynchyshyn, Sihem Iles, Aoumria Bouziane, Luciana Dias, Rabea Khedim-Touati, Benoît Diebold, Ludivine Perdrix
AP-HP, Hôpital Européen Georges Pompidou, Paris, France

Measurement of left ventricle ejection fraction (EF) is a current skill in echocardiography using the Simpson biplane method. It sometimes remains hard to have an objective evaluation of the EF especially in patients with suboptimal image quality.

For that automated quantification of EF using speckle tracking to calculate systolic strain (SS) might be a seducing method.

Aim of the study: To show the reproducibility of speckle tracking and its correlation with both EF measured by Simpson and S wave (S DTI), depending on patient's echogenicity and the number of green cross obtained with tracking.

Method: A complete echocardiography was performed on 158 patients; speckle tracking was performed by a confirmed echocardiographist and a beginner.

Results: The mean age was 65 years, 58.7% were men. Echogenicity was considered good for 64% of the patients. Systolic strain variability was 9%. Correlation between EF and SS was 0.64 for all patients, 0.69 for patients with only green cross, 0.81 for patients with good image quality, and 0.82 for patients with good image quality and green cross (p<0.05 in all cases).

Correlation between S DTI and SS was 0.5 for all patients, 0.51 for patients with only green cross, 0.58 for patients with good image quality, and 0.7 for patients with good image quality and green cross (p<0.05 in all cases).

We also studied the correlation between EF and the sum of SS and S DTI, with r=0.67 for all patients, 0.81 for patients with good image quality, and 0.82 for patients with good image quality and green cross (p<0.05 in all cases).

Conclusion: The variability of SS was low showing a good reproducibility of the method even with beginners.

The correlation was stronger between EF and the sum of SS and S DTI, and it gets stronger for patients with good image quality or with an exclusive green cross tracking.

169

Usefulness of Doppler echocardiography in the diagnosis of diastolic heart failure in the elderly

Fatima Belmourida [Orateur], Roger Kongo, Nouhad Jardi, Hasnaa Salih, Rachida Habbal, Leila Azzouzi, Ahmed Bennis
CHU Ibn Rochd, Cardiologie, Casablanca, Maroc,

Introduction: Echocardiography is a key consideration in the management of diastolic heart failure, the measurement of ejection fraction of left ventricle is therefore fundamental.

Objective: In this work we propose to outline the epidemiological, clinical and echocardiographic findings in patients with diastolic heart failure.

Materials and methods: Our retrospective study included 44 patients with clinical and echocardiographic evidence of diastolic heart failure with ejection fraction ≥45%, who were hospitalized during the period from November 2006 to March 2010 at the therapeutic unit of heart failure in department of Cardiology – CHU Ibn Rochd Casablanca Morocco.

Results: Of a total of 1200 patients hospitalized with heart failure in unit of heart failure. 3.6% had diastolic heart failure with a male predominance (61%), average age of 75±8 years.

The dyspnea was constant (95.2%), patients had heart failure NYHA class I (6%), NYHA class II (37.9%), NYHA class III (44%) and NYHA class IV (7%).

Doppler echocardiography was performed in all patients, ejection fraction was measured by the method of Simpson biplane and was ≥45% in 44 patients who all had elevated filling pressures of left ventricle.

Filling pressures of left ventricle were assessed by the study of mitral flow by pulsed-wave doppler, with restrictive filling in 68.1% of patients with E / A ratio >2, deceleration time <150 ms and time isovolumic relaxation <60 ms, the mitral flow was normal with E / A ratio: 1 to 2 in 31.8% of cases.

In mitral inflow and annulus tissue doppler: the E / Ea ratio was ≥15 in 88.6% of cases and E / Ea ratio ≥9 and ≤14 in 11.3% of patients and in this case we have had recourse to the analysis of pulmonary venous flow with an A pulmonary wave – A mitral wave duration ≥30 ms, the measurement of left atrium volume was ≥34 ml/m², and the measurement of pulmonary artery systolic pressure was >35 mmhg.

Conclusion: Doppler echocardiography in diastolic heart failure measure filling pressures of the left ventricle and also beneficial to the etiologic, prognostic and follow up.